

## CLAIMS

[1] A semiconductor optical device in which a mesa-stripe stacked body including at least a p-type  
5 cladding layer, an active layer and an n-type cladding layer is formed on a p-type semiconductor substrate, a current-blocking layer is buried in both sides of said stacked body, and an n-type over-cladding layer and an n-type contact layer are disposed on said current-  
10 blocking layer and said stacked body, said semiconductor optical device being characterized in that:

said n-type over-cladding layer is made of a semiconductor crystal having a property for flattening  
15 a concavo-convex shape of upper surfaces of said current-blocking layer and said stacked body.

[2] A semiconductor optical device according to claim 1, characterized in that an n-type dopant for said  
20 semiconductor crystal is a group VI element.

[3] A semiconductor optical device according to claim 2, characterized in that the n-type dopant is selenium.

25 [4] A semiconductor optical device according to claim 3, characterized in that doping concentration of the selenium is equal to or higher than  $5 \times 10^{18} \text{ cm}^{-3}$ .

[5] A semiconductor optical device according to claim 2, characterized in that said semiconductor crystal is an InP crystal.

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[6] A semiconductor optical device according to claim 5, characterized in that the n-type dopant is selenium.

[7] A semiconductor optical device according to claim 6, characterized in that doping concentration of the selenium is equal to or higher than  $5 \times 10^{18} \text{ cm}^{-3}$ .

[8] A semiconductor optical device according to claim 1, characterized in that said current-blocking layer is a high-resistive layer made of a semi-insulating semiconductor crystal.

[9] A semiconductor optical device according to claim 8, characterized in that said high-resistive layer is doped with ruthenium.

[10] A semiconductor optical device according to claim 9, characterized in that said high-resistive layer is made of an InP crystal doped with ruthenium.

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[11] A semiconductor optical device according to claim 1, characterized in that said current-blocking layer

is formed of a high-resistive layer made of an n-type semiconductor crystal and a semi-insulating semiconductor crystal.

- 5 [12] A semiconductor optical device according to claim 11, characterized in that said high-resistive layer is made of a semi-insulating semiconductor crystal doped with at least one of ruthenium and iron.
- 10 [13] A semiconductor optical device according to claim 12, characterized in that said high-resistive layer is made of an InP crystal doped with at least one of ruthenium and iron.
- 15 [14] A semiconductor optical device according to claim 1, characterized in that said current-blocking layer is made of an n-type semiconductor crystal and a p-type semiconductor crystal.
- 20 [15] A semiconductor optical device according to claim 14, characterized in that said current-blocking layer is made of an n-type InP crystal and a p-type InP crystal.
- 25 [16] A method of fabricating a semiconductor optical device, characterized by comprising the step of:  
forming a stacked body including at least a p-

type cladding layer, an active layer and an n-type cladding layer on a p-type semiconductor substrate;

processing said stacked body into a mesa stripe-like shape;

5 burying a current-blocking layer in both sides of said mesa stripe-shaped stacked body;

forming an over-cladding layer to flatten a concavo-convex shape of upper surfaces of said current-blocking layer and said stacked body; and

10 forming an n-type contact layer on said n-type over-cladding layer.